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(54) **ELECTRICAL CONNECTOR ASSEMBLY HAVING EXTRA SIGNAL CONTACT**

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H01R 27/02 (2006.01)
H01R 24/62 (2011.01)

(52) **U.S. Cl.**
CPC ***H01R 27/02*** (2013.01); ***H01R 13/6593*** (2013.01); *H01R 24/62* (2013.01)

(58) **Field of Classification Search**
CPC H01R 13/6593; H01R 27/02
USPC 439/660, 701, 607.55, 607
See application file for complete search history.

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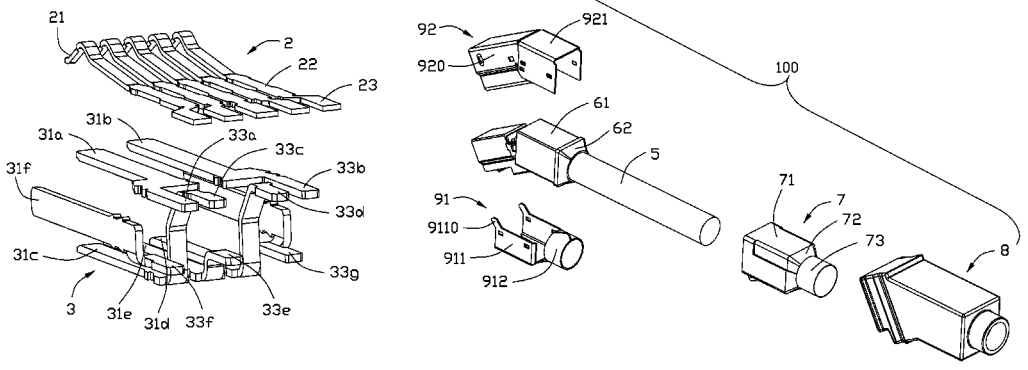
(57) **ABSTRACT**

An electrical connector assembly (**100**) comprises an insulative housing (**1**) comprising a lower wall, a receiving space (**110**), a cavity (**120**) above the receiving space (**110**), a shielding shell (**9**) enclosing the insulative housing (**1**), a number of contacts (**2**, **3**) received in the insulative housing (**1**) and a cable (**5**). The contacts (**2**, **3**) comprise a number of first contacts (**2**) for transmitting USB 3.0 signal and a number of second contacts (**3**) capable of transmitting USB 2.0 signal, and an extra signal contact (**3***e*) transmitting an extra signal. The second contacts are partly received in the receiving space (**110**). The first contacts are partly received in the cavity (**120**). The engaging section of the extra signal contact (**3***e*) is located on an inner surface of the lower wall.

18 Claims, 15 Drawing Sheets



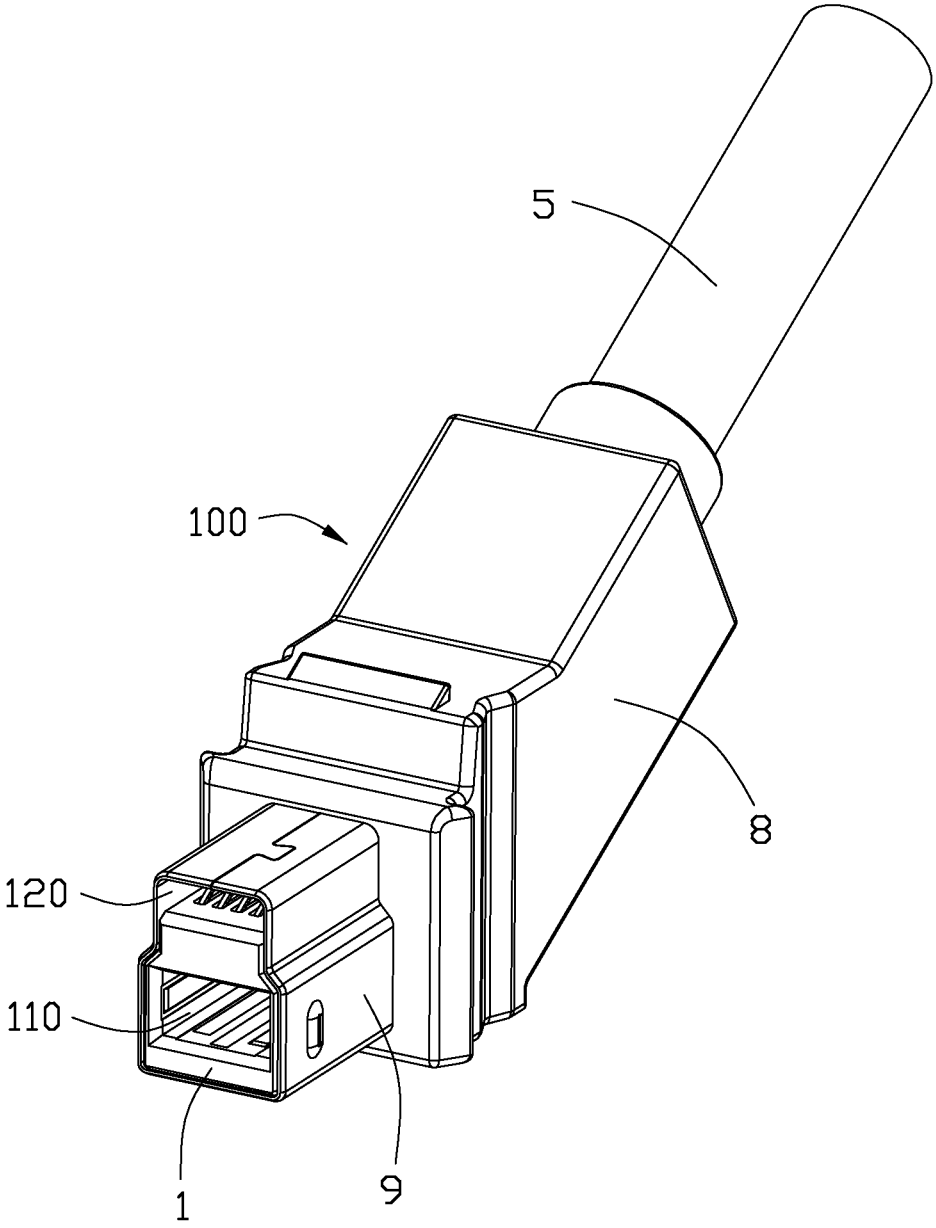


FIG. 1

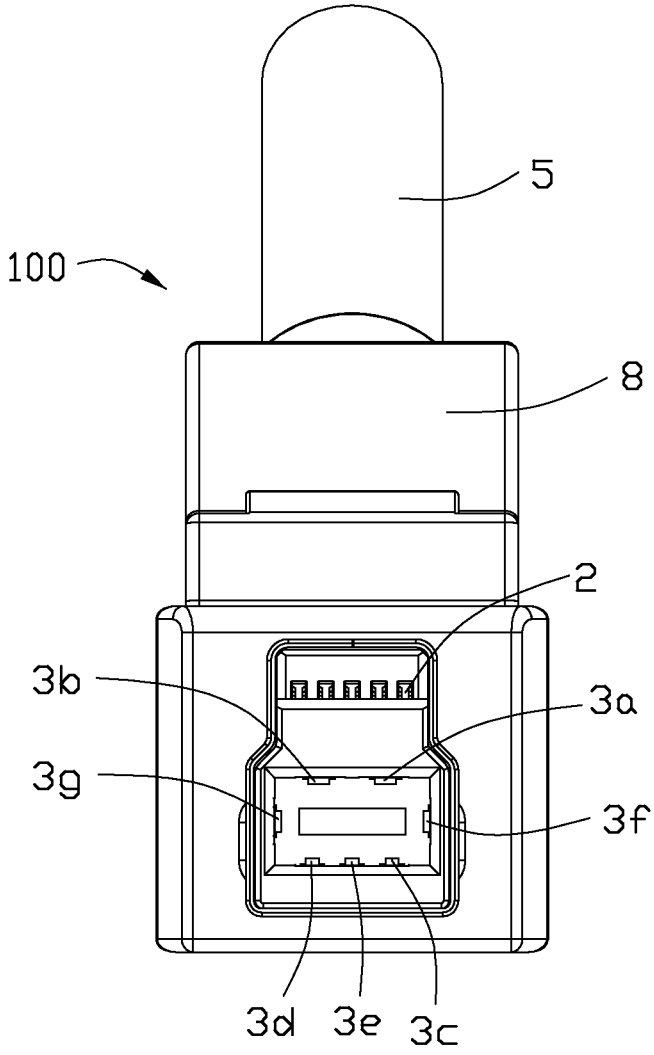
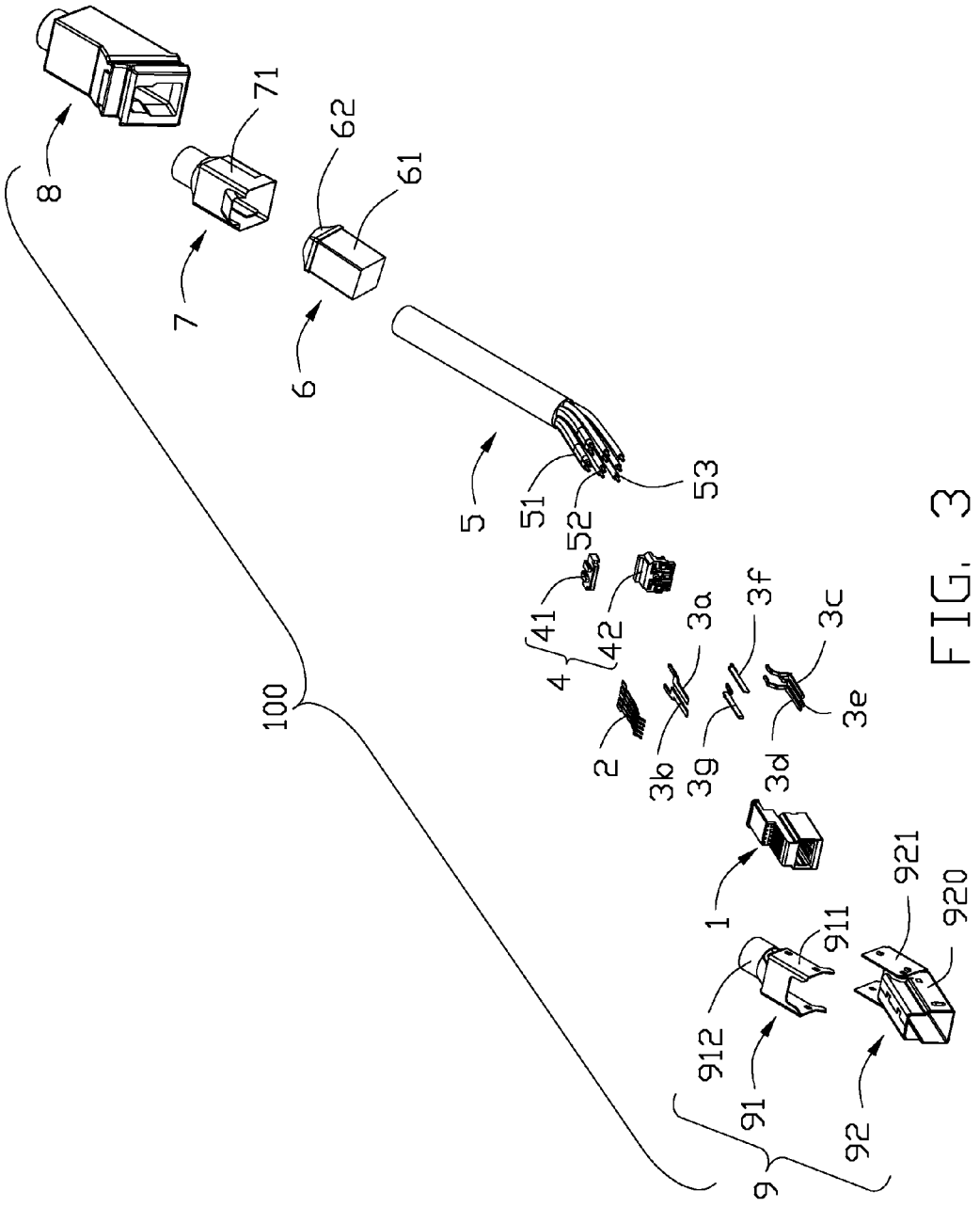


FIG. 2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71
7
62
61
6
5
51
52
53
41
42
4
2
3a
3b
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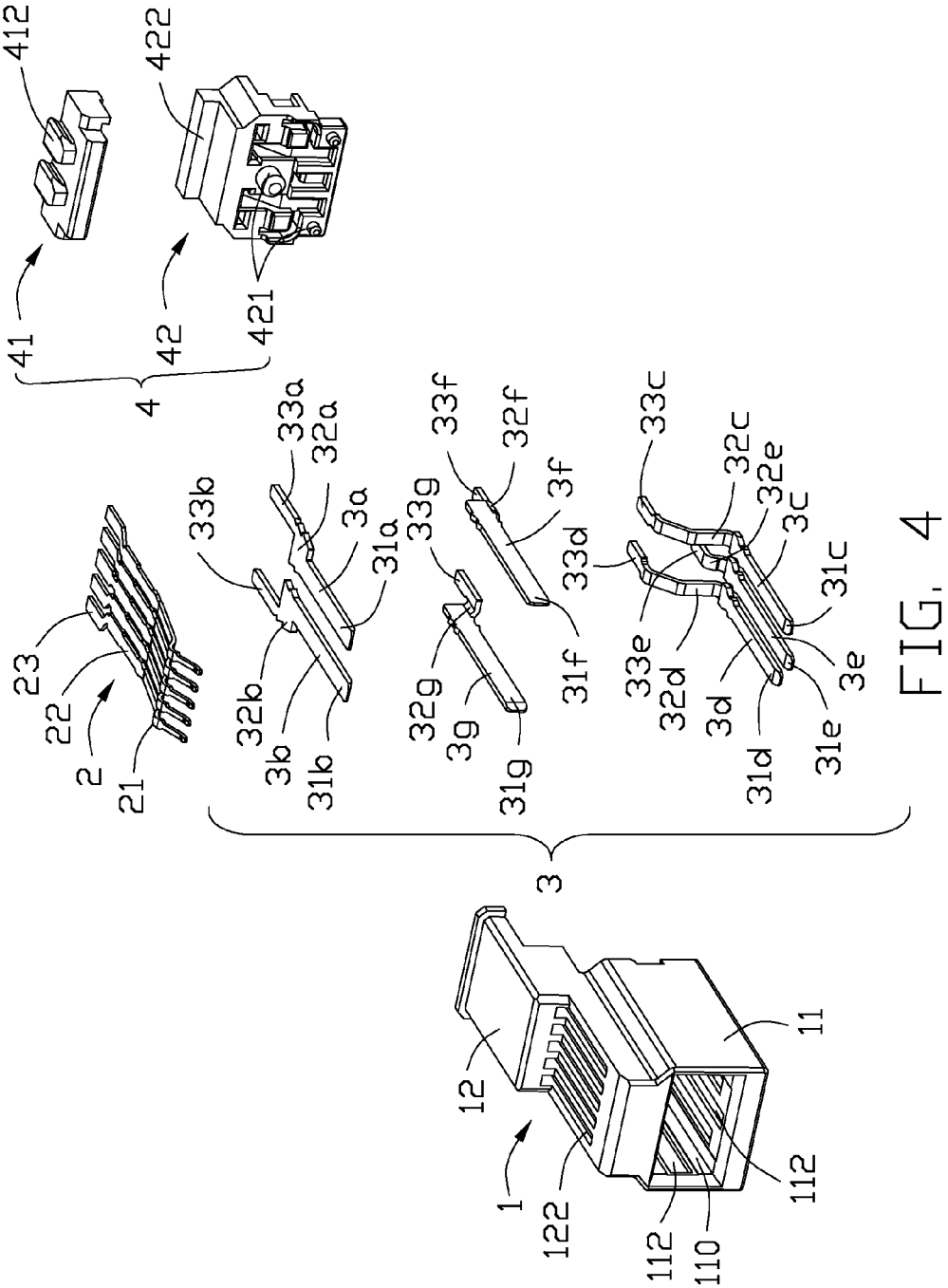
3g
3c
3d
3e
1
921
920
911
912
91
92
9
100

FIG. 3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422
41
42
421
4
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33b
3a
31a
33f
32f
33g
3f
33d
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32c
32e
3c
31c
23
22
2
21
32b
3b
31b
32g
3g
31g
31f
33e
32d
3d
31d
31e
3e
3
12
11
1
122
112
110
112

FIG. 4

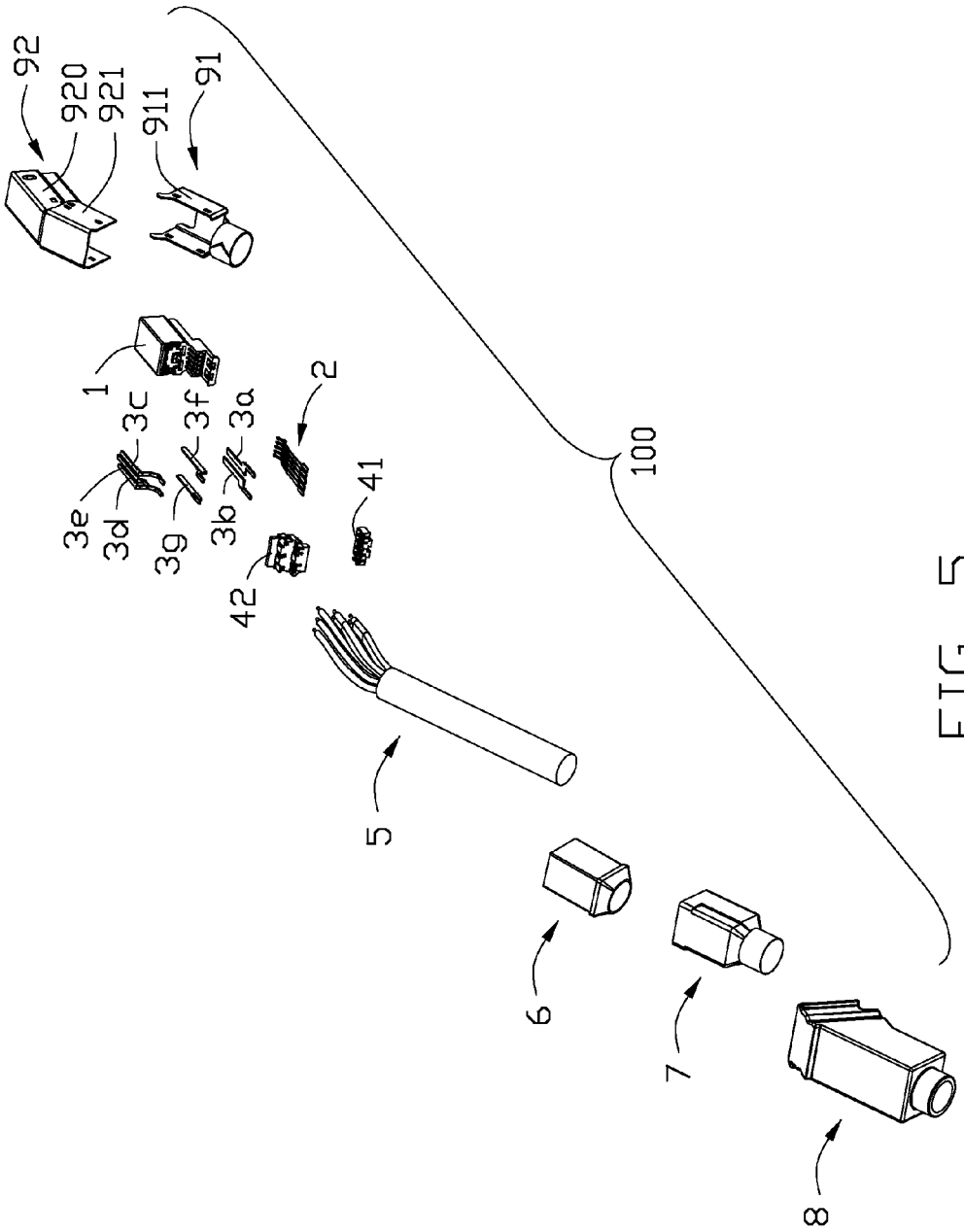
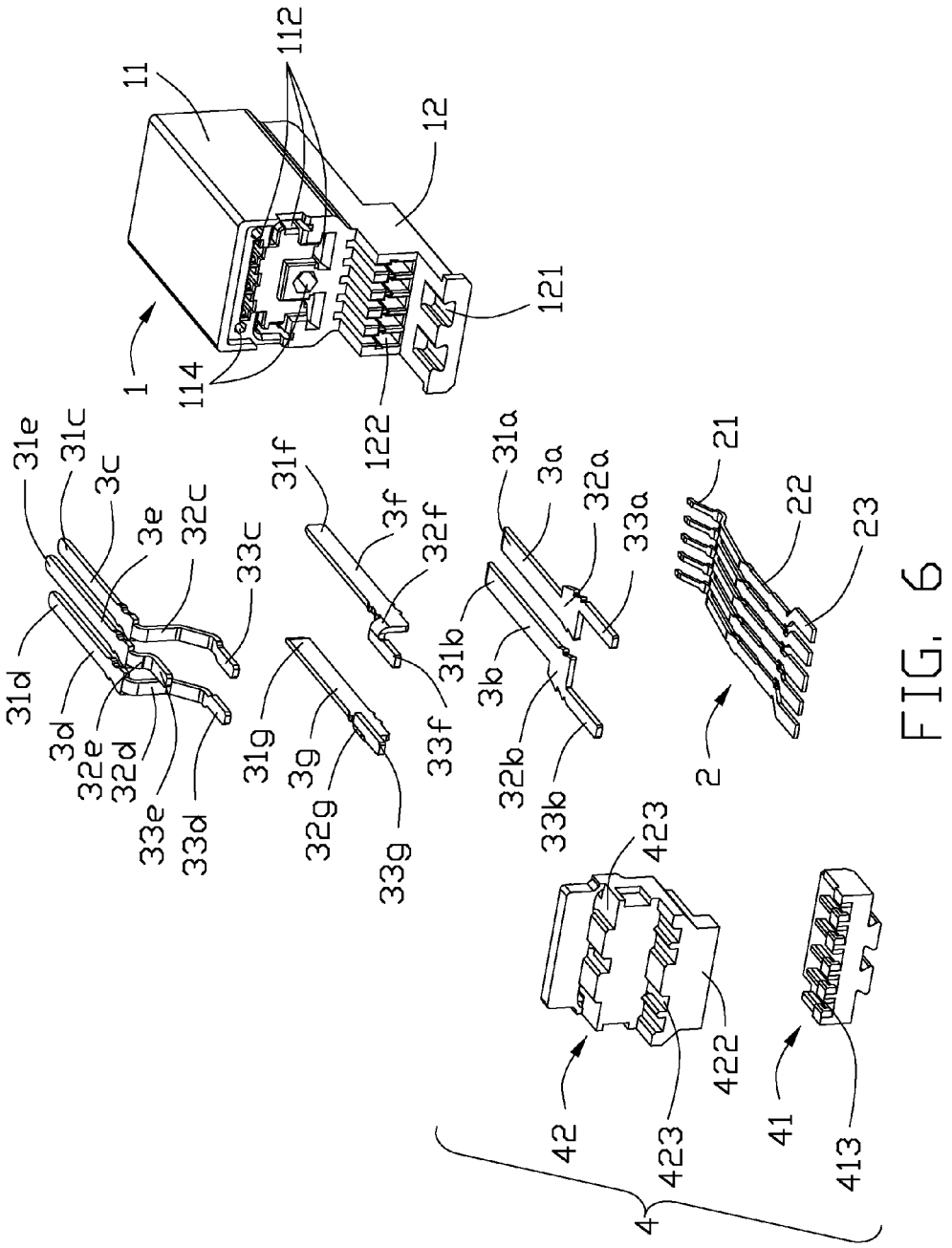


FIG. 5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112
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121
1
114
122
31e
31c
3c
3e
32c
33c
31d
3d
32e
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33e
33d
31f
3f
32f
31g
3g
32g
33g
33f
31a
3a
32a
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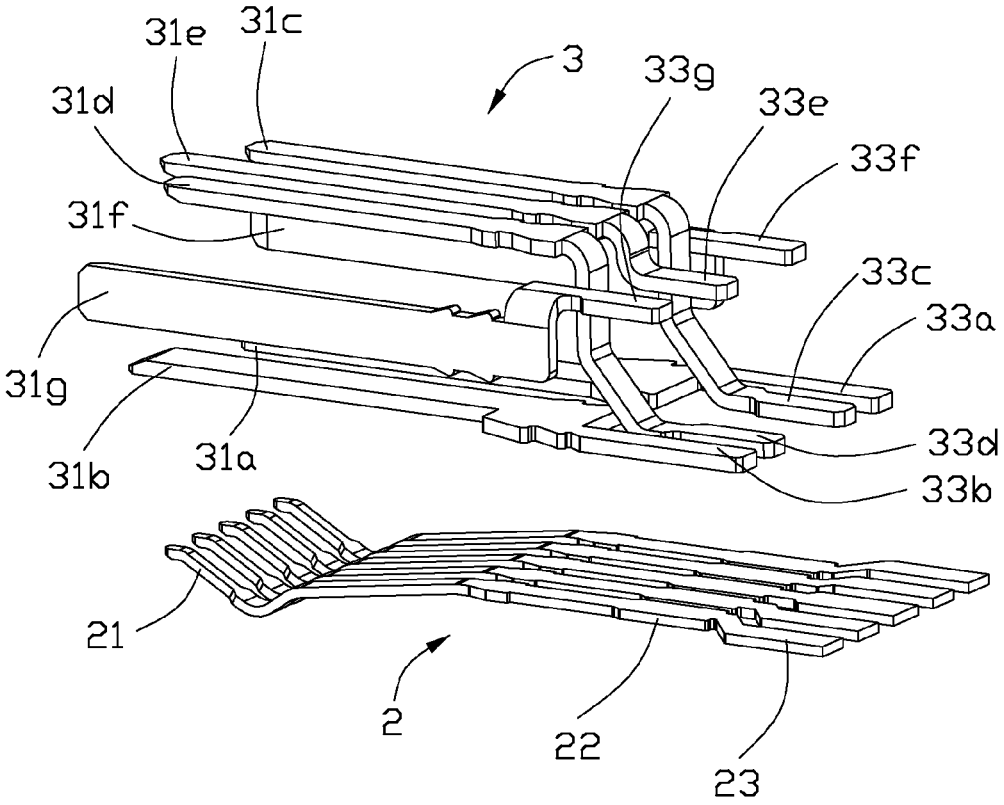
21
22
23
2
423
422
42
423
41
413
4

FIG. 6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31c
3
33g
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33e
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33a
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33d
31b
31a
33b
21
2
22
23

FIG. 7

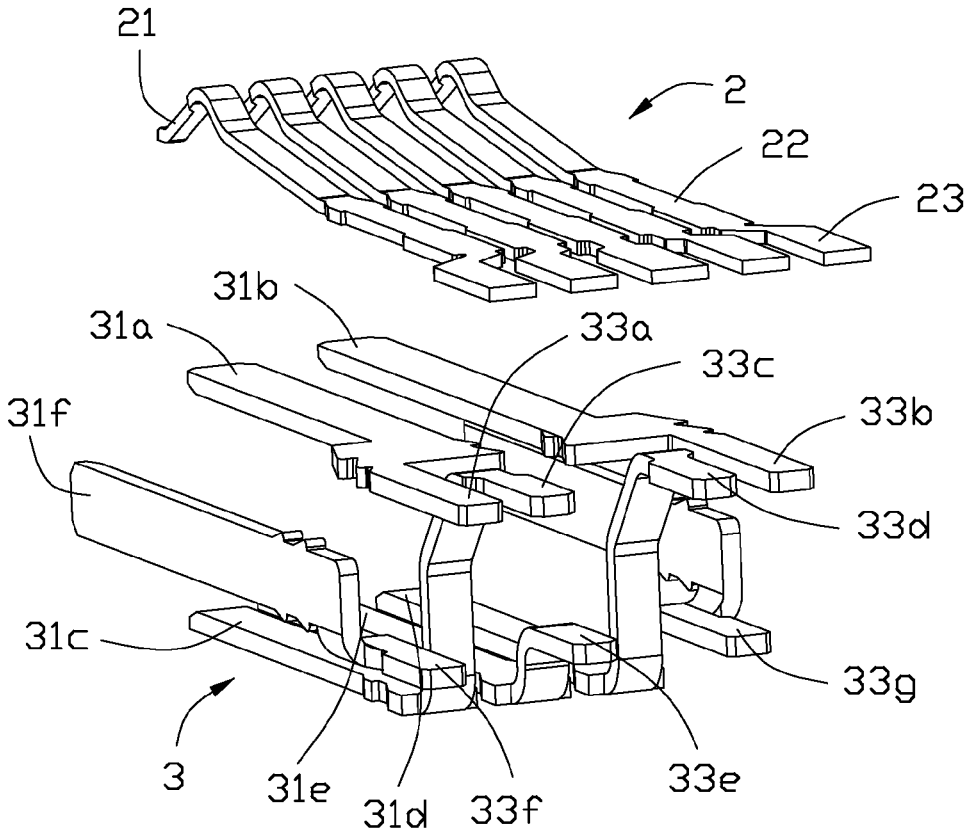

FIG. 8

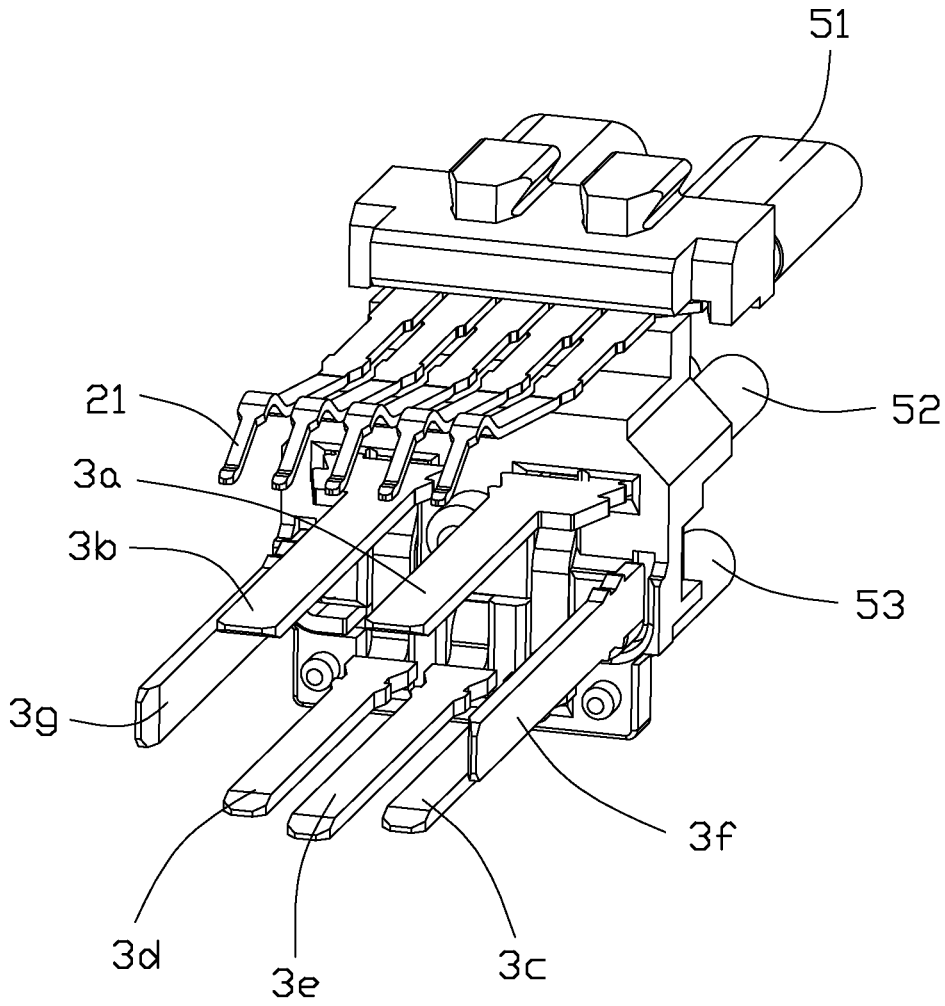

FIG. 9

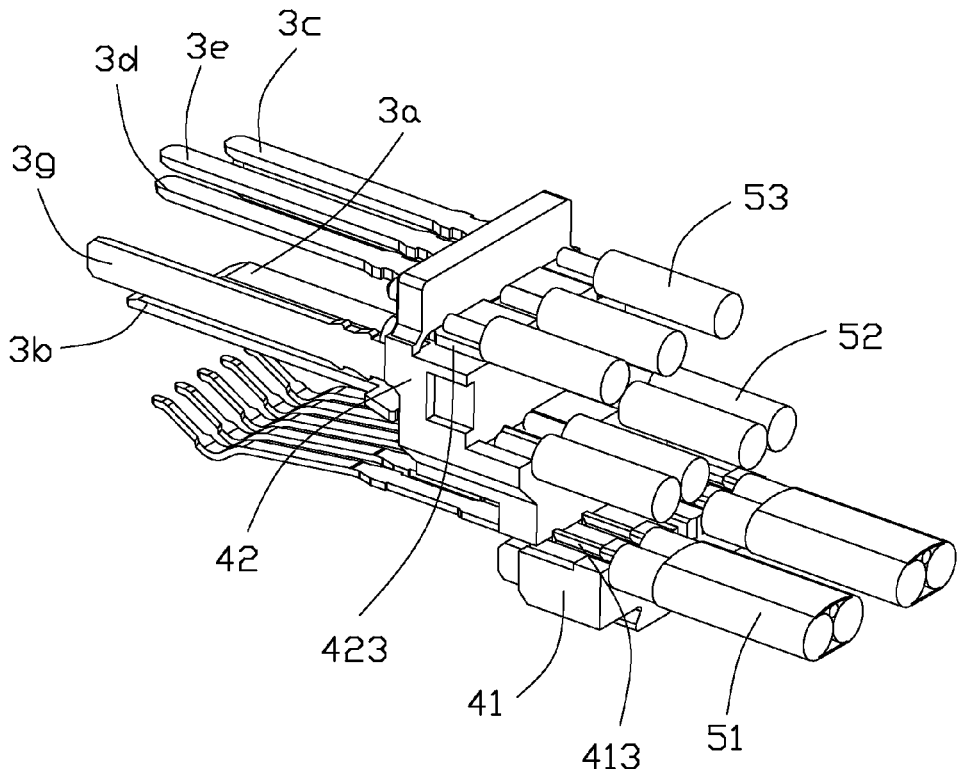

FIG. 10

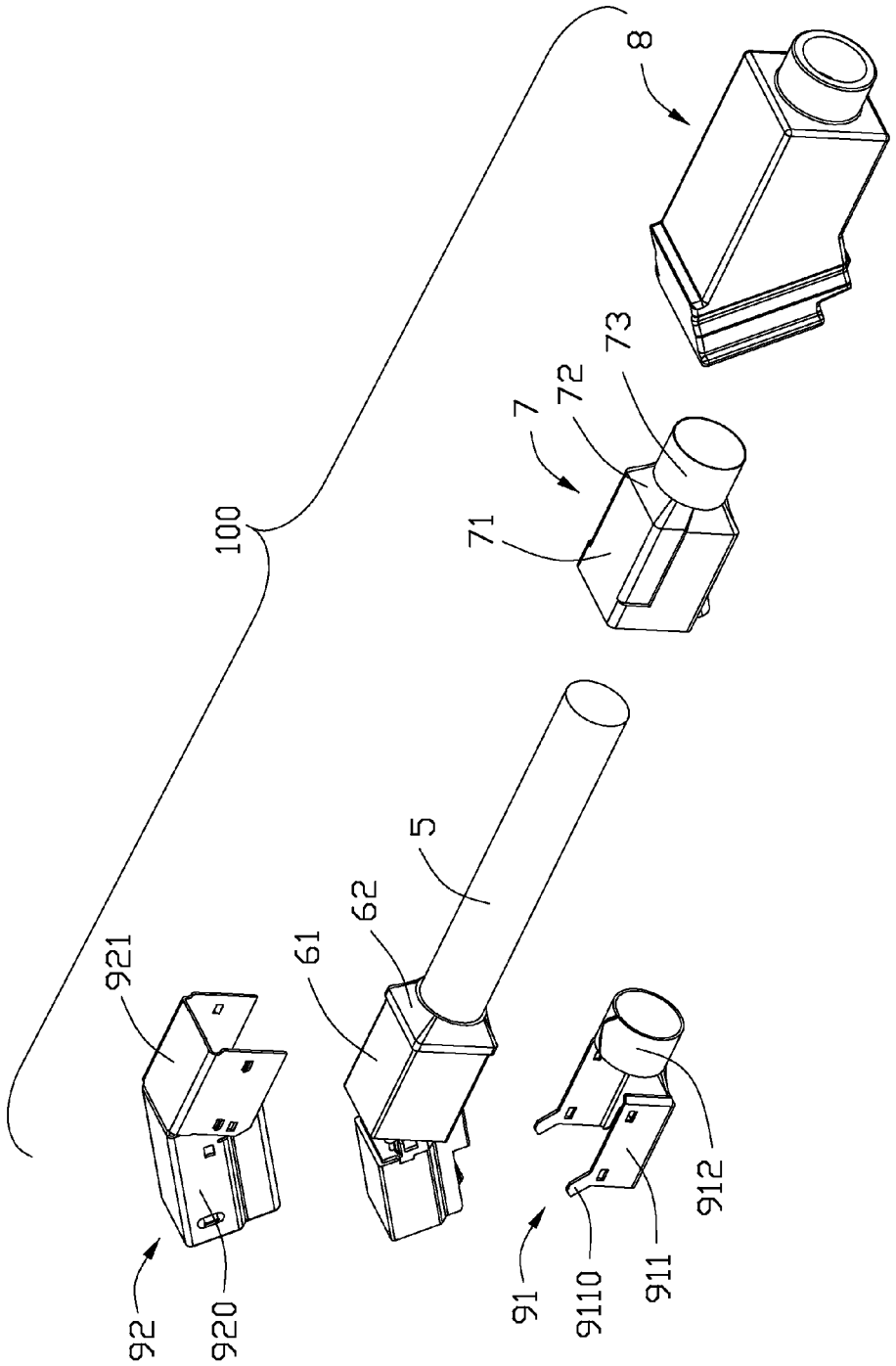

FIG. 11

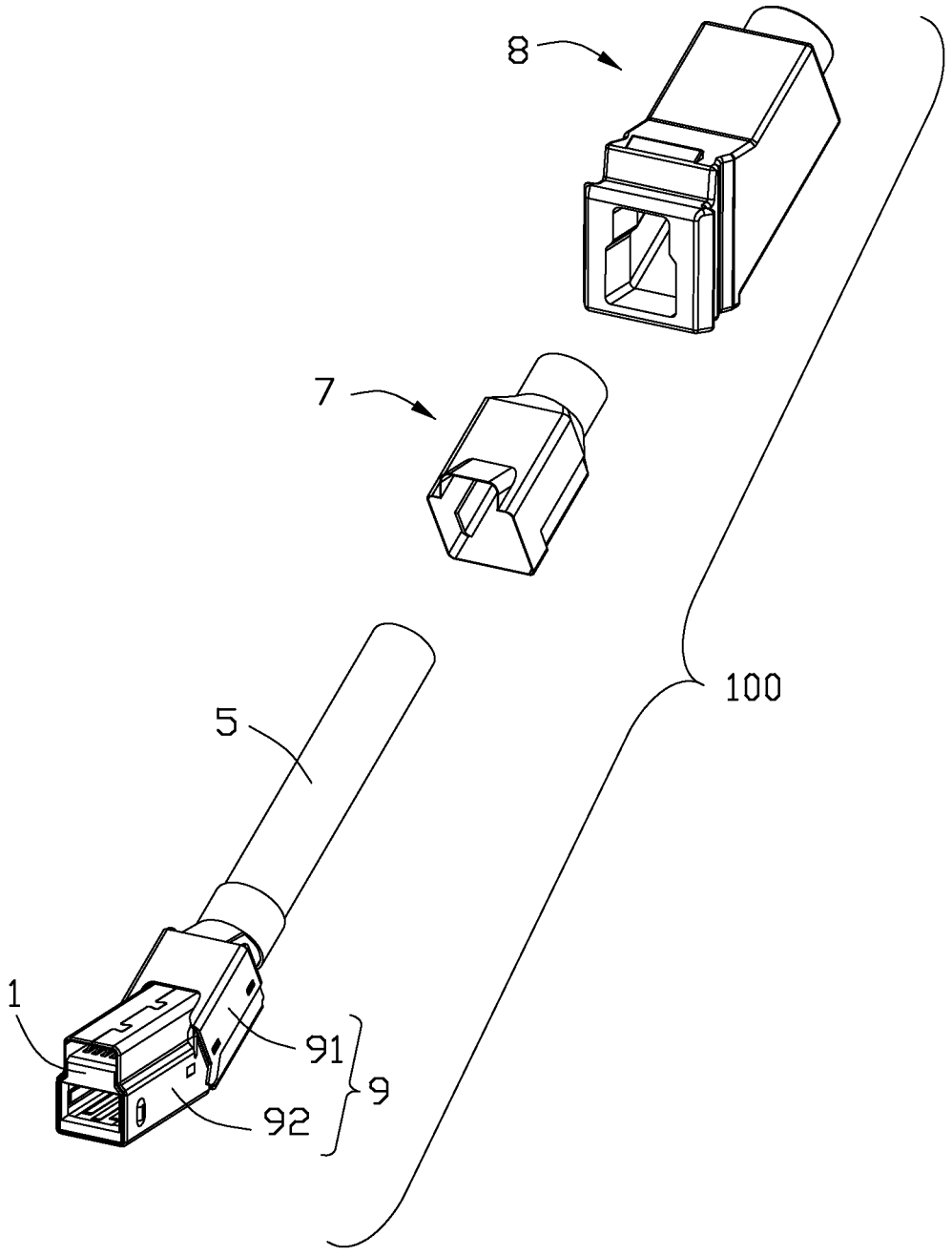

FIG. 12

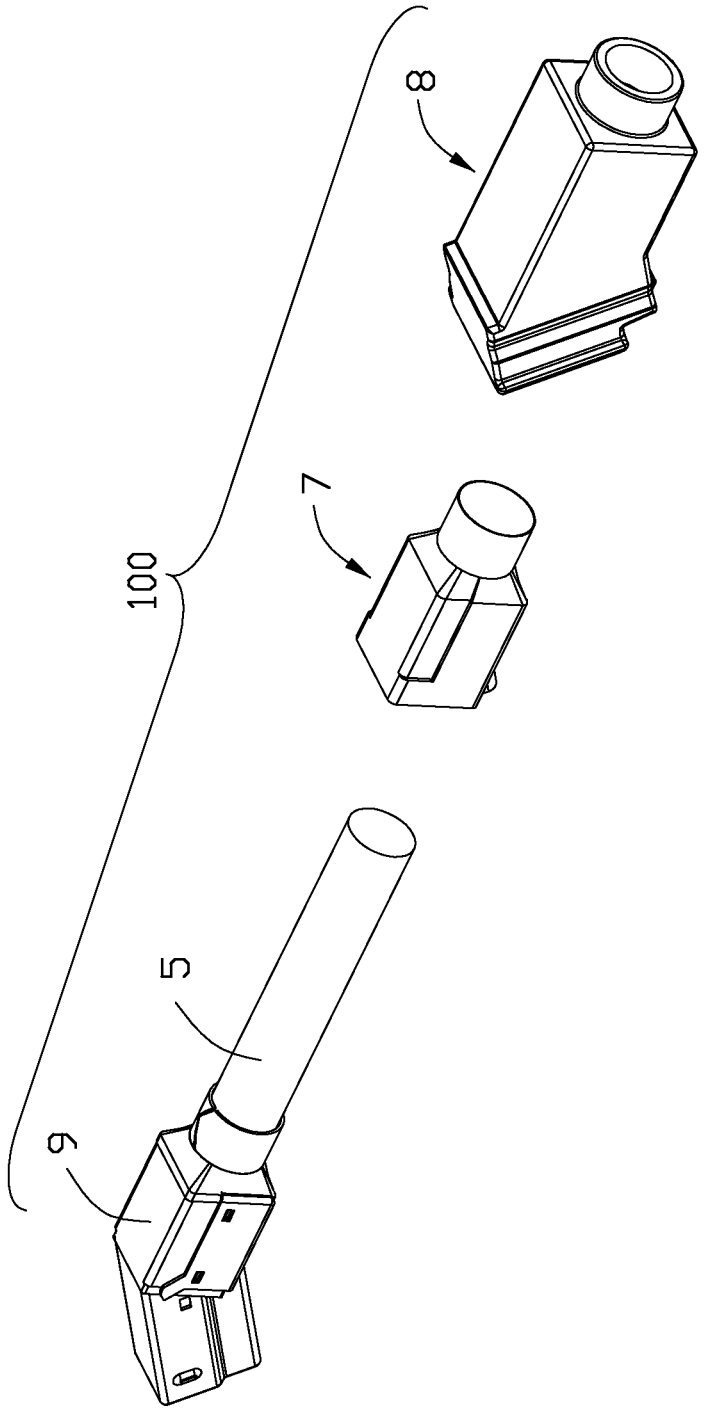

FIG. 13

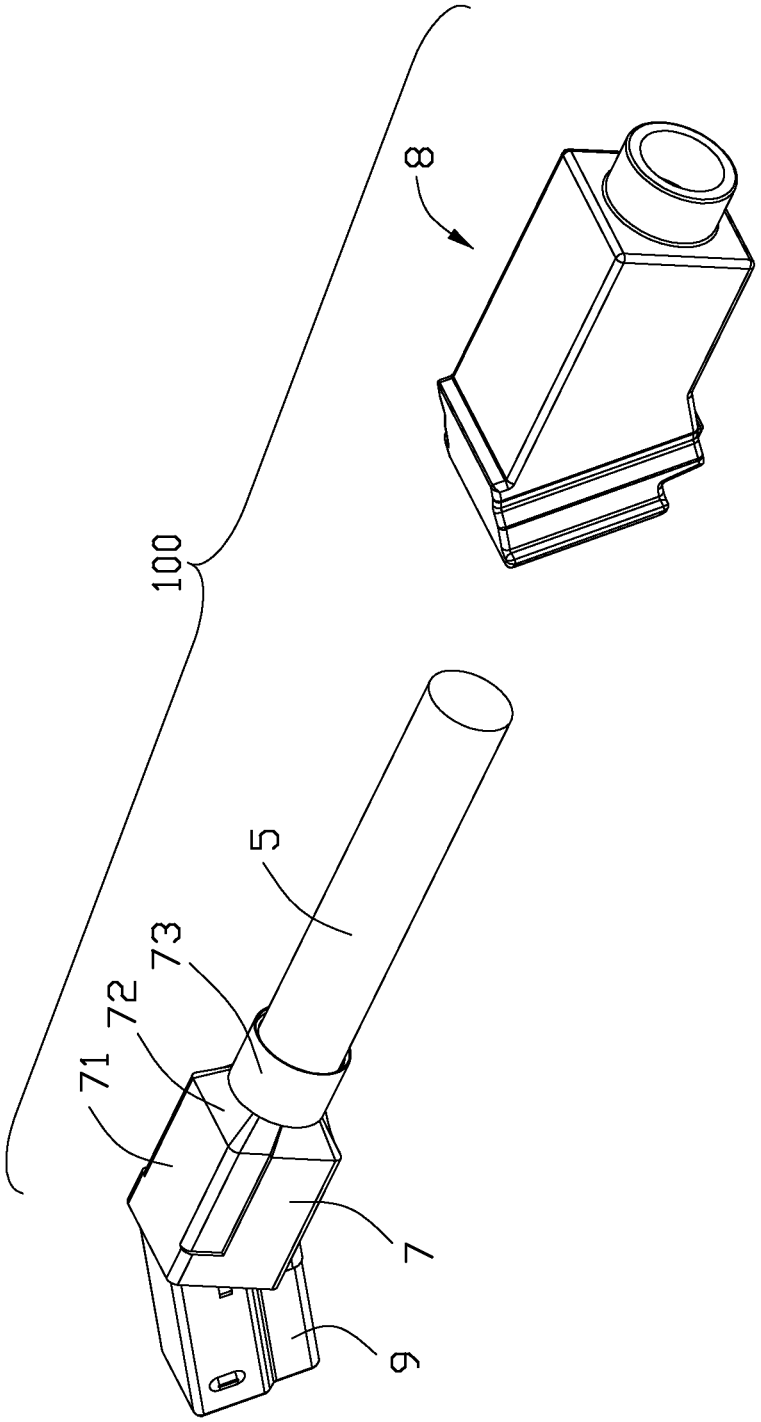

FIG. 14

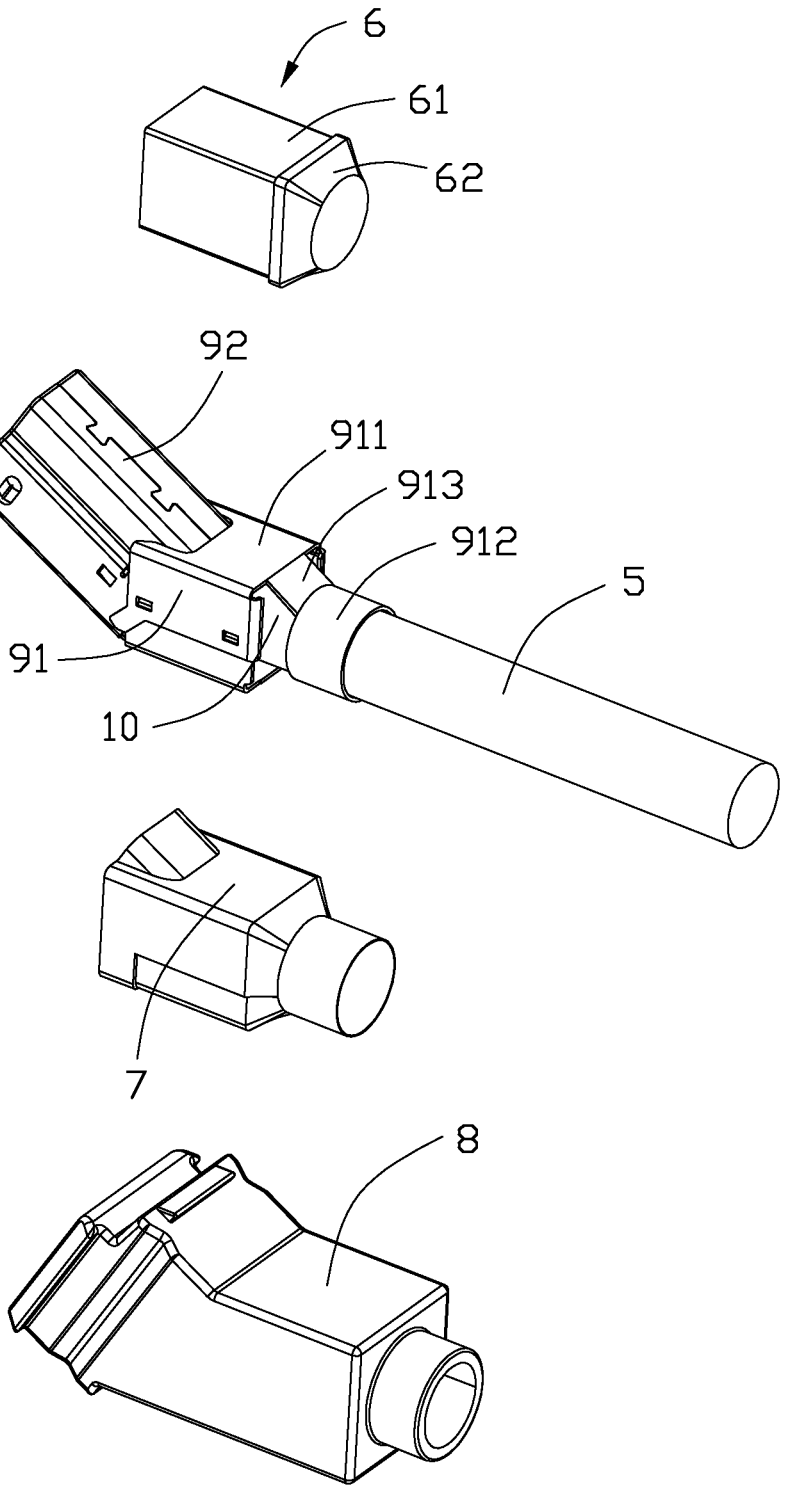

FIG. 15

ELECTRICAL CONNECTOR ASSEMBLY HAVING EXTRA SIGNAL CONTACT

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates generally to an electrical connector assembly, and more particularly to an electrical connector assembly including an extra signal contact for transmitting an extra signal.

2. Description of Related Arts

U.S. Pat. No. 7,559,805, issued on Jul. 14, 2009, discloses that an electrical connector assembly comprises: a first opening accommodating a plurality of first plug contacts; a second opening having a plurality of second plug contacts exposed thereto; the first and the second openings separated by a separate plate and the first and the second plug contacts disposed on opposite first and second sides of the separate plate, respectively; and a pair of plug power contacts having contact portions located on opposite lateral sides of the second opening, the contact portions being exposed to the second opening.

An electrical connector assembly adding an extra contact to the second opening is needed.

SUMMARY OF THE INVENTION

Accordingly, an object of the present invention is to provide an electrical connector assembly with an extra function.

To achieve the above object, an electrical connector assembly includes an electrical connector assembly includes an insulative housing comprising a top wall, a lower wall, two side walls, a receiving space surrounded by the top wall, the lower wall and the two side walls, a cavity above the receiving space, a shielding shell enclosing the insulative housing, a plurality of contacts received in the insulative housing and a cable connected with a rear of the contacts. The contacts comprise a plurality of first contacts for transmitting USB 3.0 signal and a plurality of second contacts. The second contacts comprise a power contact, a positive signal contact, a negative signal contact, a grounding contact, these power, positive signal, negative signal, and grounding contacts transmitting USB 2.0 signal, and an extra signal contact. Each contact comprises an engaging section and a soldering section. The extra signal contact transmits an extra signal. The engaging sections of the second contacts are received in the receiving space. The engaging sections of the first contacts are received in the cavity. The engaging section of the extra signal contact is located on an inner surface of the lower wall.

To achieve the above object, an electrical connector assembly includes an insulative housing, a plurality of contacts received in the insulative housing, a cable connected with the contacts, an inner insulator comprising a wrapping portion wrapping a rear end of the insulative housing and a front end of the cable and a supporting portion extending rearwardly from the wrapping portion, a shielding shell mounted onto the inner insulator and defining a gap and a copper foil mounted to the shielding shell. The supporting portion is exposed outwardly via the gap for supporting the copper foil.

Other objects, advantages and novel features of the invention will become more apparent from the following detailed description when taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a perspective, assembled view of an electrical connector assembly of the present invention;

FIG. **2** is a front view of the electrical connector assembly shown in FIG. **1**;

FIG. **3** is a perspective, exploded view of the electrical connector assembly shown in the FIG. **1**;

FIG. **4** is an enlarged view of a housing, a plurality of contacts and a spacer of the electrical connector assembly shown in FIG. **3**;

FIG. **5** is another perspective, exploded view of the electrical connector assembly, taken from a different view with respect to FIG. **3**;

FIG. **6** is an enlarged view of a housing, the contacts and the spacer of the electrical connector assembly shown in FIG. **5**;

FIG. **7** is a perspective, assembled view of the contacts of the electrical connector assembly shown in FIG. **1**;

FIG. **8** is an another perspective, assembled view of the contacts of the electrical connector assembly, taken from a different view with respect to FIG. **7**;

FIG. **9** is a perspective, assembled view of the contacts, the spacer and a cable of the electrical connector assembly shown in FIG. **1**;

FIG. **10** is another perspective, assembled view of the contacts, the spacer and the cable of the electrical connector assembly, taken from a different view with respect to FIG. **9**;

FIG. **11** is a perspective, partially assembled view of the electrical connector assembly shown in FIG. **1**;

FIG. **12** is a perspective, further partially assembled view of the electrical connector assembly shown in FIG. **11**;

FIG. **13** is an another perspective, partially assembled view of the electrical connector assembly, taken from a different view with respect to FIG. **12**; and

FIG. **14** is a perspective, further partially assembled view of the electrical connector assembly shown in FIG. **13**; and

FIG. **15** is an exploded view of the cable, an inner insulator, a copper foil, and a cover and a shielding shell.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Reference will now be made in detail to the preferred embodiment of the present invention. Referring to FIGS. **1** to **12**, an electrical connector assembly **100** of the present invention comprises an insulative housing **1**, a plurality of contacts **2**, **3** received in the insulative housing **1**, a spacer **4** assembled to an end of the insulative housing **1**, a cable **5** electrically connecting to the contacts **2**, **3**, an inner insulator **6** mounted to the rear end of the insulative housing **1** and the front end of the cable **6**, a shielding shell **9** enclosing the insulative housing **1**, a copper foil **7** mounted to a rear end of the shielding shell **9**, a cover **8** mounted to the shielding shell **9** and the copper foil **7**. The contacts **2**, **3** comprise a plurality of first contacts **2** and a plurality of second contacts **3**. The electrical connector assembly **100** defines a receiving space **110** and a cavity **120** located above the receiving space **110**. The contacts **2**, **3** comprises an engaging section and a soldering tail, a plurality of engaging sections of the second contacts **3** are accommodated in the receiving space **110**, a plurality of engaging sections of the first contacts **2** are accommodated in the cavity **120**.

Referring to FIGS. **3** to **6**, the insulative housing **1** includes a base section **11** and a rear section **12**. The base section **11** defines a top wall, a lower wall, two side walls

and the receiving space **110** extending from a mating direction and surrounded by said four walls. Inner faces of the top wall, the lower wall and the two side walls define a plurality of second receiving passageways **112** for receiving the second contacts **3** respectively. The top wall defines two second receiving passageways **112**, the lower wall defines three second receiving passageways **112**, the two side walls define a receiving passageway **112** respectively. The receiving passageways **112** extend from the front and rear direction and reach to the rear surface of the base section **11**. The rear section **12** extends upwardly and rearwardly from the top surface of the base section **11** and the base section **11** and the rear section **12** form a trapeziform shape. The rear section **12** defines a plurality of first receiving passageways **122** through a front surface and a back surface for receiving the first contacts **2**, and a front end of the first receiving passageway **122** extend to the top surface of the base section **11**.

Referring to FIGS. **4** to **8**, the first contacts **2** are used for high-speed transmission and comprise two pairs of differential signal contacts and a grounding contact. One pair of the two pairs of differential signal contacts are used for exporting high-speed transmission, and the other pair of the differential signal contacts are used for receiving high-speed transmission. The grounding contact is located in the middle of the two pairs of differential signal contacts for reducing a signal interference. Each first contact **2** comprises an elastic engaging section **21**, a soldering tail **23** and a connecting section **22** connecting the engaging section **21** and the soldering tail **23**. The soldering tails **23** are arranged in a row along the horizontal direction, the distance between the soldering tails **23** of the two outmost pairs of the first contacts **2** is bigger than the distance between the engaging sections **21** thereof. The first contacts **2** are received in the first receiving passageways **122** of the insulative housing **1**.

Referring to FIGS. **2** to **8**, each second contact **3** comprises an engaging section, a soldering tail and a connecting section connecting the engaging section and the soldering tail. The second contact **3** comprises a negative signal contact **3***a*, a power contact **3***b*, a positive signal contact **3***c*, a grounding contact **3***d*, an extra grounding contact **3***f*, an extra power contact **3***g* and an extra signal contact **3***e*.

The second contacts **3** having upper contacting portions **31** are labeled as **3***b*, **3***a* from left to right, the second contacts **3** having lower contacting portions **31** are labeled as **3***d*, **3***e*, **3***c* along a left to right direction, the second contacts **3** having middle contacting portions **31** are labeled as **3***g*, **3***f*. The negative signal contact **3***a* and the power contact **3** comprise tabular engaging sections **31***a*, **31***b*, soldering tails **33***a*, **33***b* and connecting sections **32***a*, **32***b*, respectively. The soldering tails **33***a*, **33***b* and the engaging sections **31***a*, **31***b* are coplanar and the distance between the soldering tails **33***a*, **33***b* is bigger than the distance between the engaging sections **31***a*, **31***b*. The positive signal contact **3***c* and the grounding contact **3***d* comprise tabular engaging sections **31***c*, **31***d*, connecting sections **32***c*, **32***d* extending upwardly and rearwardly from the engaging sections **31***c*, **31***d*, and soldering tails **33***c*, **33***d* extending rearwardly from the connecting sections **32***c*, **32***d*, respectively. The soldering tails **33***c*, **33***d* and the soldering tails **33***a*, **33***b* are coplanar. The extra signal contact **3***e* comprises a tabular engaging section **31***e*, a connecting section **32***e* extending upwardly and rearwardly from the engaging section **31***e* and a soldering section **33***e* extending rearwardly from the connecting section **32***e*. The soldering section **33***e* and the soldering sections **33***c*, **33***d* are not coplanar. The extra grounding contact **3***f* and the extra power contact **3***g* comprise vertical engaging section **31***g*, **31***f*, soldering tails **33***g*, **33***f* bent toward each other and extending rearwardly horizontally and connecting sections **32***g*, **32***f* connecting the engaging section **31***g*, **31***f* and the soldering tails **33***g*, **33***f*. The soldering tails **33***g*, **33***f* and the soldering tail **33***e* are coplanar.

The engaging section **31***b* of the power contact **3***b* and the engaging section **31***a* of the negative contact **3***a* are located on the inner surface of the top wall. The engaging section **31***c* of the positive contact **31** and the engaging section **31***d* of the grounding contact **3***d* are located on the inner surface of the lower wall and located at opposite sides of the engaging section **31***e* of the extra signal contact **3***e*. The soldering sections **33***a* of the negative signal contact **3***a*, the soldering sections **33***b* of the positive signal contact **33**, the soldering sections **33***d* of the grounding contact **3***d* and the soldering sections **33***b* of the power contact **3***b* are arranged along an upper row from right to left. The soldering sections **33***f* of the extra grounding contact **3***f*, the soldering sections **33***e* of the extra signal contact **3***e* and the soldering sections **33***g* of the extra power contact **3***g* are arranged along a lower row from right to left.

Referring to FIGS. **7** to **10**, the soldering tails **33***a*, **33***b* and the engaging sections **31***a*, **31***b* are coplanar and the distance between the soldering tails **33***a*, **33***b* is bigger than the distance between the engaging sections **31***a*, **31***b*. The positive signal contact **3***c* and the grounding contact **3***d* comprise tabular engaging sections **31***c*, **31***d*, connecting sections **32***c*, **32***d* extending upwardly and rearwardly from the engaging sections **31***c*, **31***d*, and soldering tails **33***c*, **33***d* extending rearwardly from the connecting sections **32***c*, **32***d*, respectively. The soldering tails **33***c*, **33***d* and the soldering tails **33***a*, **33***b* are coplanar. The extra signal contact **3***e* comprises a tabular engaging section **31***e*, a connecting section **32***e* extending upwardly and rearwardly from the engaging section **31***e* and a soldering section **33***e* extending rearwardly from the connecting section **32***e*. The front face of engaging section **31***e* of the extra signal contact **3***e* is closer to the front face of the insulative housing **1** than the front face of the engaging sections **31***c*, **31***d* of the positive contact **3***c* and the grounding contact **3***d*.

The soldering section **33***e* and the soldering sections **33***c*, **33***d* are not coplanar. The extra grounding contact **3***f* and the extra power contact **3***g* comprise vertical engaging section **31***g*, **31***f*, soldering tails **33***g*, **33***f* bent toward each other and extending rearwardly on the horizontal and connecting sections **32***g*, **32***f* connecting the engaging section **31***g*, **31***f* and the soldering tails **33***g*, **33***f*. The soldering tails **33***g*, **33***f* and the soldering tail **33***e* are coplanar.

The spacer **4** is assembled to the rear of the insulative housing **1**, and comprises an upper spacer **41** and a lower spacer **42** assembled to the upper spacer **41**. The lower spacer **42** is assembled to the rear of the base section **11** of the insulative housing **1**. The lower spacer **42** comprises a plurality of posts **421** extending forwardly from a front face of the lower spacer **42**, two step faces formed on the rear end and a limit block **422** extending upwardly from the front end of the upper step face and mating with the upper spacer **41**. The base section **11** of the insulative housing **1** defines a plurality of mounting holes **221** mating with the corresponding posts **421**. The step faces define a plurality of soldering grooves **423** of the soldering tails **33** of the second contacts **3**. The upper spacer **41** is assembled to the rear of the rear section **12** and the upper of the lower spacer **42**. The upper spacer **41** defines a plurality of fixed blocks **412** extending upwardly from the top surface thereof and a plurality of soldering grooves **413** formed on the lower surface thereof

for receiving the soldering tails **23** of the first contacts **2**. The rear section **12** of the insulative housing **1** defines a plurality of dovetail grooves **121** formed on the lower surface thereof for receiving the fixed blocks **412**. The dovetail grooves **121** and the fixed blocks **412** are trapezoid.

The shielding shell **9** is made of metallic material, and comprises a first shielding shell **91** and a second shielding shell **92** assembled to the first shielding shell **91**. The second shielding shell **92** comprises a tubular portion **920** and a drawer portion **921** extending rearwardly from the tubular portion **920**. The cross section of tubular portion **920** is convex. The first shielding shell **91** is mounted to the drawer portion **921** of the second shielding shell **92**. The first shielding shell **91** comprises a mating portion **911**, a pair of springs **9110** formed at the front end of the side walls thereof, a holding portion **912** extending rearwardly from the rear thereof and a connecting arm **913** connecting the holding portion **912** and the mating portion **911**. There is a gap **10**, referring to FIG. **15**, formed in the rear of the shielding shell **9** surrounded by the drawer portion **921**, the mating portion **911**, the connecting arm **913** and the holding portion **912**.

The cable **5** comprises a first row of wires **51**, a second row of wires **52** and a third row of wires **53** having different diameters. The diameters of the three rows of wires **51**, **52**, **53** decreases by degrees from upper to lower. In actual, the real diameters of each row of the three rows of wires **51**, **52**, **53** are not necessarily identical and the wires have similar diameters are placed in a row. The first row of wires **51** are soldered with the soldering sections **23** for transmitting a USB 3.0 signal. The second row of wires **52** are soldered with the soldering sections **33***a*, **33***c*, **33***d*, **33***b* of the upper row of the second contact **3** from left to right, respectively. The third row of wires **53** are soldered with the soldering sections **33***f*, **33***e*, **33***g* of the lower row of the second contact **3** from left to right, respectively. The wires have similar diameters are placed in a row, so that the cable **5** and the contacts **2**, **3** can be soldered automatically.

The inner insulator **6** comprises a wrapping portion **61** and a conical supporting portion **62** extending rearwardly from the wrapping portion **61**. The copper foil **7** comprises a main portion **71** mounted to the shielding shell **9**, a tilting portion **72** extending rearwardly from the main portion and a ring portion **73** extending rearwardly from the tilting portion **72**. The cover **8** is molded to the shielding shell **9**, the copper foil **7** and a front end of the cable **5**.

Referring to FIGS. **1** to **14**, in assembly, the first contacts **2** are received in the first receiving passageway **122**, the second contacts **3** are divided into three rows and received in the second receiving passageway **112**, respectively. The spacer **4** is mounted to the rear of the insulative housing **1**. The soldering sections **23**, **33** of the first contacts **2** and the second contacts **3** arranged into two rows pass through the spacer **4** and are received in the corresponding soldering grooves **413**, **423**, and then the soldering sections **23**, **33** are soldered to the corresponding first contacts **2** and the corresponding second contacts **3**. The second shielding shell **92** is mounted to the insulative housing **1**, and the cavity **120** are located above the receiving space **110** and formed surrounded by the top wall of the shielding shell **92** and the top surface of the base section **11**. The first contacts **2** are received in the cavity **120**, the second contacts **3** are received in the receiving space **110**. The inner insulator **6** is molded out of a connecting portion of the contacts **2**, **3** and the cable **5**. The supporting portion **62** is exposed outwardly via the gap **10** for supporting the copper foil **7**. The supporting portion **62** has a configuration mating that of the tilting portion **72**. The first shielding shell **91** is assembled to the rear of the second shielding shell **92**, and then the first shielding shell **91** and the second shielding shell **92** encloses the insulator housing **1**, the inner insulator **6** and the front end of cable **5**. The copper foil **7** is mounted to the rear of the shielding shell **9**, and the cover **8** is molded out of the shielding shell **9** and the copper foil **7**. In the present invention, the copper foil **7** can improve the function of EMI. The supporting portion **62** supports the copper foil **7** for preventing the copper foil **7** to be crushed while the cover **8** is molded, and then achieving the function of EMI better.

In the present invention, the first contacts **2** transmit the USB 3.0 signal, the power contact **3***b*, the positive signal contact **3***c*, the negative signal contact **3***a* and the grounding contact **3***d* of the second contacts **3** transmit the USB 2.0 signal. The extra signal contact **3***e* of the second contacts **3** can transmit an extra signal from the out device to the electrical connector assembly **100** for achieving an extra requirement. The front surface of the engaging section **31***e* of the extra signal contact **3***e* is closer to the front surface of the insulative housing **1** than the engaging sections **31***c*, **31***d* of the positive signal contact **3***c* and the grounding contact **3***d*, so that the extra signal contact **3***e* can transmit the extra signal firstly. The soldering sections of the second contacts **3** are divided into two rows. The cable are divided into three rows according the different diameters and then connected with the first contacts **2** and the second contacts **3**, respectively. The cable **5** can be efficiently soldered to the first contacts **2** and the second contacts **3** and the function of EMI can be improved at the same time.

What is claimed is:

1. An electrical connector assembly, comprising:

an insulative housing comprising a top wall, a lower wall, two side walls, a receiving space surrounded by the top wall, the lower wall and the two side walls, and a cavity above the receiving space;

a shielding shell enclosing the insulative housing;

a plurality of contacts received in the insulative housing, the contacts comprising a plurality of first contacts and a plurality of second contacts, the second contacts comprising a power contact, a positive signal contact, a negative signal contact, a grounding contact, and an extra signal contact, each contact comprising an engaging section and a soldering section;

a cable connected with a rear of the contacts;

an inner insulator mounted to the rear end of the insulative housing and the front end of the cable, the inner insulator comprising a wrapping portion and a conical supporting portion extending rearwardly from the wrapping portion; and

a copper foil mounted to the rear of the shielding shell, the rear end of the shielding shell enclosing the inner insulator, the copper foil comprising a tilting portion mounted to the supporting portion of the inner insulator;

wherein the engaging sections of the second contacts are received in the receiving space, the engaging sections of the first contacts are received in the cavity, the engaging section of the extra signal contact is located on an inner surface of the lower wall.

2. The electrical connector assembly as claimed in claim **1**, wherein the engaging sections of the power contact and the negative signal contact are located on the inner surface of the top wall, and the engaging sections of the positive signal contact and the grounding contact are located on the inner surface of the lower wall and located at opposite sides of the extra signal contact.

3. The electrical connector assembly as claimed in claim 2, wherein a front surface of the engaging section of the extra signal contact is closer to the front surface of the insulative housing than the engaging sections of the positive signal contact and the grounding signal contact.

4. The electrical connector assembly as claimed in claim 2, wherein the second contacts comprise an extra power contact and an extra grounding contact, the engaging sections of the extra power contact and the extra grounding contact located on inner surfaces of the side walls of the insulative housing.

5. The electrical connector assembly as claimed in claim 2, wherein the soldering sections of the negative signal contact, the positive signal contact, the grounding contact, and the power contact are arranged in an upper row from right to left, and the soldering sections of the extra grounding contact, the extra signal contact, and the extra power contact are arranged in a lower row from right to left.

6. The electrical connector assembly as claimed in claim 5, wherein the cable comprises three rows of wires, the first row of wires soldered to the soldering sections of the first contacts, the second row of wires soldered to the upper row of the soldering sections of the second contacts, the third row of wires soldered to the lower row of the soldering sections of the second contacts.

7. The electrical connector assembly as claimed in claim 1, wherein the shielding shell comprises a first shielding shell and a second shielding shell assembled to the first shielding shell, the second shielding shell comprising a tubular portion and a drawer portion extending rearwardly from the tubular portion.

8. The electrical connector assembly as claimed in claim 1, further comprising a spacer mounted to a rear end of the insulative housing and a cover mounted to the shielding shell, the insulative housing comprising a base section and a rear section extending rearwardly from the base section, the spacer comprising an upper spacer and a lower spacer.

9. An electrical connector assembly comprising:

an insulative housing;

a plurality of contacts received in the insulative housing;

a cable connected with the contacts;

an inner insulator comprising a wrapping portion wrapping a rear end of the insulative housing and a front end of the cable and a supporting portion extending rearwardly from the wrapping portion;

a shielding shell mounted onto the inner insulator and defining a gap with regard to the cable; and

a copper foil mounted to the shielding shell and comprising a main portion wrapping the shielding shell and a tilting portion extending rearwardly from the main portion; wherein

the supporting portion fills the gap for supporting the copper foil and has a configuration matching that of the tilting portion.

10. The electrical connector assembly as claimed in claim 9, wherein the wrapping portion is overmolded with the rear end of the insulative housing and the front end of the cable.

11. The electrical connector assembly as claimed in claim 9, wherein the copper foil further comprises a ring portion extending rearwardly from the tilting portion.

12. The electrical connector assembly as claimed in claim 9, wherein the shielding shell comprises a first shielding shell and a second shielding shell assembled to the first shielding shell, the second shielding shell comprising a tubular portion and a drawer portion extending rearwardly from the tubular portion, the first shielding shell comprising a mating portion, a holding portion extending rearwardly from the rear thereof, and a connecting arm connecting the holding portion and the mating portion.

13. The electrical connector assembly as claimed in claim 12, wherein the gap is surrounded by the drawer portion, the mating portion, the connecting arm, and the holding portion.

14. The electrical assembly as claimed in claim 9, wherein said supporting portion forms a truncated pyramidal configuration.

15. An electrical connector assembly comprising:

an insulative housing forming a receiving space surrounded by opposite upper and lower interior surface in a vertical direction, and opposite side interior surfaces in a transverse direction perpendicular to said vertical direction;

a plurality of first contacts disposed in the housing with corresponding first contacting sections located on the upper interior surface;

a plurality of second contacts disposed in the housing with second contacting sections located on the side interior surfaces;

a plurality of third contacts disposed in the housing with third contacting sections located on the lower interior surface;

some of the first contacts having corresponding tail sections extending toward the third contacts to be grouped with those of the third contacts in the transverse direction, and remainder of the third contacts having the corresponding tail sections grouped with those of the second contacts in said transverse direction.

16. The electrical connector assembly as claimed in claim 15, wherein all the third contacts lie in one same horizontal plane in the transverse direction.

17. The electrical connector assembly as claimed in claim 15, wherein each of the second contacts defines the contacting section in a vertical plane and the tail section in a horizontal plane perpendicular to each other.

18. The electrical connector assembly as claimed in claim 15, wherein there are three first contacts, and the tail section of a middle one is grouped with those of the second contacts, and the tail sections of two outer ones are grouped with those of the third contacts.

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